

FINAL REPORT

**Sea Turtle Abundance and Relocation Trawling
Contract No. DACW64-02-B-0024**

**Sabine Pass Bar and Entrance Channel
Sabine, Texas**



Dates:

22 JULY 02-13 AUG 02

Submitted by:

**Trish Bargo
REMSA, Inc.
Marine Endangered Species Observer
Program Director
25 September 2002**

ABSTRACT

A twenty-four-hour-per-day sea turtle relocation project was conducted onboard the fishing vessel Miss Anna during the dredging project in Sabine, Texas from July 22, 2002 through August 13, 2002. Species targeted included Loggerhead (*Caretta caretta*), Kemp's Ridley (*Lepidochelys kemp*i), Green (*Chelonia mydas*), Leatherback (*Dermochelys coriacea*), and Hawksbill (*Eretmochelys imbricata*) sea turtles. A total of eight (8) sea turtles were caught, tagged, and safely released approximately 4 miles off the coast of Texas.

INTRODUCTION

The sea turtle relocation project was initiated as a safety precaution by the US Army Corps of Engineers (COE), Galveston District, after other projects (Brownsville; Port Mansfield) within their district neared or exceeded the National Marine Fisheries Service (NMFS) incidental take limit of Green (*Chelonia mydas*) sea turtles. Consultation between the NMFS Protected Resources Division (PRD) and COE Galveston regarding dredging the Sabine Channel began on June 12, 2002 in which the Galveston District requested that NMFS modify the Regional Biological Opinion (RBO) to require and authorize sea turtle abundance and relocation trawling during hopper dredging operations in the COE's Galveston District. The consultation referred to is No. 1/SER/2002/00600 and a copy is appended to this report (Appendix 1).

SCOPE OF WORK

The sea turtle abundance and relocation trawling project in Sabine, Texas was contracted by Weeks Marine, Inc. The party agreeing to provide relocation trawling services (*Remsa, Inc.*) was to be responsible for providing the trawler, nets, equipment, and the necessary trained personnel. Pre-dredge trawling was to be conducted 12 hours per day for a period of five (5) days. Methods and equipment were standardized as much as possible including data sheets, nets, trawling speed and direction to tide, length of segment, length of tow, and numbers of tows per segment. Trawling was conducted with repetitive 15-30 minute (total time) tows in the channel. Data sheets were provided by the COE. Positions at the beginning and end of each tow were determined from GPS positioning equipment. Tow speed was taken at the approximate mid point of each tow. The trawler was fitted with two 60 foot trawling nets constructed from 8 inch mesh (stretch) as specified by the COE turtle trawling net specification (see appendix 2).

All turtles that were caught were identified, measured, tagged, and released approximately four miles off the Texas coast (away from the dredging project). Turtles were tagged with Inconel tags previously obtained from the University of Florida's Archie Carr Center for Sea Turtle Research in each of the front flippers according to National Marine Fisheries Service protocol. Aseptic conditions were maintained for tag attachment and the tags themselves. Data on turtles was entered on standard data sheets provided by the COE. Photographs were taken of each turtle and appended to this report (Appendix 3).

Water temperature measurements were taken at the surface twice daily. Weather conditions were recorded including air temperature, wind velocity and direction, and sea state-wave height. High and low tides that include each tow time were recorded in military time.

Permits for handling threatened and endangered species were obtained from the appropriate state agencies and are appended to this report (Appendix 4).

RESULTS

Sea turtle abundance and relocation trawling began on July 22, 2002 with five (5) days of "pre-dredge" trawling for twelve (12) hours per day. Two turtles were caught during the 5-day pre-dredge period. On July 27, 2002 the hopper dredge *BE Lindholm* began dredging the Sabine Bar Channel and trawling was increased to twenty-four (24) hours per day for the duration of the project which concluded on August 13, 2002. Trawling was conducted for a total of twenty-three (23) days with a total of 489 tows of 30 minutes or less. A total of eight (8) sea turtles were captured, tagged, and released safely away from the project area.

Trawling reports were completed for each tow which included: begin tow and end tow times, depth, speed mid tow, latitude and longitude, station/bouys, water temperature, wave height, air temperature, wind speed, bycatch, number of turtles, and comments were recorded. Copies of these reports were turned in to the COE Galveston district on a daily basis. Copies of these reports will not be duplicated for this report because of the sheer volume but copies are available upon request.

The mean sea temperature during this period averaged thirty (30°) degrees with a fluctuation of +/- 2°C. The bycatch on this project was not significant but certain sea turtle prey species such as blue crab were fairly abundant. An estimated list of bycatch is appended to this report (Appendix 5). A large number of bottlenose dolphins (*Tursiops truncatus*) were present in the project area during the entire project. Schools of Amberjack (*Seriola dumerili*) were observed in large numbers below and around the trawler.

DISCUSSION-RECOMMENDATIONS

Damaged and destroyed nets became a serious issue on this trawling project. "Bogging down" is a common occurrence in channels that are being dredged. The dragheads of hopper dredges often make deep "grooves" in the channel which can wreak havoc on trawl nets. On the evening of 10 August 2002 at approximately 2050 hours, the last two of six nets were torn in half and completely destroyed. The trawler was forced to return shoreside for the extensive repairs. At approximately 11-1200 hours the following morning the trawl supervisor was informed that the dredge had taken a turtle (*Caretta caretta*). It is unfortunate that this turtle was taken as a direct result of damaged/destroyed nets, but is unclear how this situation could have been avoided. It is unreasonable to assume that an unlimited number of trawl nets be available as the cost of one net is approximately \$1,200.00 and the webbing has to be made to order, a process which can take up to 6-8 weeks. Remsa, Inc. has requested permission to increase the thickness of the nylon webbing from 36 gauge to 68-72 gauge which would make the nets more durable without compromising the design or production of the net. Remsa, Inc. would also like to recommend decreasing the mesh size of the "standard turtle net" from an 8-inch mesh (stretch) to a 4-6-inch mesh (stretch). Although the larger mesh is effective in eliminating excessive bycatch, it compromises the safety of captured turtles as their heads and flippers get caught in the large mesh and could lead to serious injury. The laceration on the first turtle caught on this project (*Caretta caretta*, 22 July 02) was believed to have been caused as a result of the right flipper being caught in the webbing. The injury was minor and the turtle was released accordingly.

Trawling resumed at 2000 hours on 11 August 2002 and continued through project completion on 13 August 2002 with no further incidents.

If you would like more information on any aspect of this report, feel free to contact me directly at (757) 723-2930.

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APPENDIX 1
MODIFICATION OF REGIONAL BIOLOGICAL OPINION
GALVESTON DISTRICT COE

Southeast Regional Office
9721 Executive Center Drive North
St. Petersburg, FL 33702
(727) 570-5312; FAX (727) 570-5517

F/SER3:EGH

Mr. Robert Hauch
Galveston District
U.S. Army Corps of Engineers
P.O. Box 1229
Galveston, TX 77553-1229

Dear Mr. Hauch:

This responds to your June 12, 2002, faxed letter and telephone request to Mr. Eric Hawk of my Protected Resources Division (PRD) staff to reinstate emergency consultation, pursuant to section 7 of the Endangered Species Act (ESA), on the National Marine Fisheries Service's (NMFS) September 22, 1995, Regional Biological Opinion (RBO) to the U.S. Army Corps of Engineers' (COE) Galveston and New Orleans Districts. You have requested that NMFS modify the RBO to require and authorize sea turtle abundance assessment and relocation trawling during hopper dredging operations in the COE's Galveston District, until NMFS Southeast Region issues the Gulf of Mexico hopper dredging RBO (currently in preparation) which will supersede the 1995 RBO. The requirement to conduct relocation/abundance trawling (terms and conditions are non-discretionary on the part of the action agency) serves as the permitting authority to conduct the trawling, eliminating the need for additional permits under ESA section 10. We have assigned No. I/SER/2002/00600 to this consultation; please refer to it in future correspondence on this subject.

Background:

On September 22, 1995, NMFS Office of Protected Resources issued a RBO prepared by SERO PRD authorizing the incidental take of sea turtles pursuant to COE hopper dredging of navigation channels in the New Orleans and Galveston Districts. The RBO is currently being updated by PRD to include hopper dredging operations in the Gulf of Mexico by the COE's Mobile and Jacksonville Districts, and issuance is planned for early August. The draft RBO includes terms and conditions in the Incidental Take Statement requiring the use of abundance and relocation trawlers under conditions of high documented sea turtle abundance and other environmental conditions. At the time the 1995 RBO was written, PRD included language in the Conservation Recommendations recommending relocation trawling under certain conditions:

"Relocation trawling has shown limited success in east coast channels at temporarily reducing the abundance of sea turtles during periods in which dredging is required. Relocation trawling in advance of an operating dredge in Texas and Louisiana channels

should be considered if takes are documented early in a project that requires use of a hopper dredge during a period in which large numbers of sea turtles may occur."

Subsequent to issuance of the RBO, the NMFS Section 7 Consultation Manual was revised in 1998 to indicate that activities authorized by the terms and conditions of the Incidental Take Statement of a biological opinion do not require additional section 10 permitting. Conservation recommendations, however, are not part of the Incidental Take Statement, are discretionary on the part of the action agency, and therefore may not serve as the permitting authority, as had been our original intention.

Proposed Action:

The COE Galveston District has requested (in telephone conversations between COE and PRD staff) that the RBO be amended on an emergency basis to authorize relocation and abundance trawling of sea turtles planned for July 2002 at Sabine Pass and Freeport Entrance Channel, Texas, be authorized by the RBO, without the need (at least temporarily) for COE contract personnel aboard relocation/assessment trawlers to obtain section 10 research permits to conduct the activity. Currently, there are no contractors with section 10 research permits to conduct relocation trawling at Sabine Pass and Freeport Channels.

NMFS has strongly recommended to the Galveston District that relocation/assessment trawling be conducted prior to and concomitant to dredging operations at these two sites (E. Hawk, May 2, 2002, e-mail comm. to R. Hauch). Green turtles are known to be abundant there; dredging will take place when water temperatures are warm—virtually assuring turtle presence in this area. Turtles have been historically taken during hopper dredging at these sites. The COE agrees that hopper dredging is necessary; however, it may be forced to dredge without the benefit of relocation trawlers since no contractors currently hold current section 10 research permits authorizing said activity.

The Galveston District needs to maintain dredge Sabine Pass and Freeport Channel, from July-October 2002, to remove 2.1 and 2.4 million cubic yards of material, respectively. The District wishes to conduct relocation trawling to minimize and potentially avoid green sea turtle takes but because of unavoidable delays in the issuance of the section 10 permits by NMFS there are no permitted contractors available. This situation will force the COE to conduct hopper dredging without relocation trawling—to the unnecessary detriment of green sea turtle populations in the Gulf of Mexico. Based on past takes at Sabine Pass and Freeport Channel during cooler winter months when sea turtle abundance is lowest and the apparent unusual abundance of green turtles this year along the Texas coast, we anticipate that summer 2002 dredging at these sites will result in takes of loggerhead sea turtles and green turtles.

Effects Analysis: Anticipated Take by Relocation/Assessment Trawlers

Shrimp trawlers have been successfully used by the COE's Atlantic and Gulf of Mexico Districts to "sweep" the area in the path of an oncoming hopper dredge with a modified shrimp trawl net to remove turtles from the dredge's path and reduce the possibility of hopper dredge-endangered species interactions. Turtles captured by the trawlers have been safely released well away from the hopper dredge site. Relocation trawling has been successful at temporarily reducing the

abundance of sea turtles in Atlantic coast and Florida west coast channels and nearshore sand mining areas (e.g., Thimble Shoals Channel, Virginia Beach, Virginia; Bogue Banks, North Carolina; Kings Bay, Georgia; Canaveral Entrance Channel, Florida; Tampa Bay, Florida; St. Petersburg Harbor, Florida) during periods in which hopper dredging was imminent or ongoing.

NMFS expects that relocation/assessment trawling in Galveston District navigation channels may take an unquantifiable number of live loggerhead, green, hawksbill, and Kemp's ridley sea turtles, and Gulf sturgeon. Relocation trawling may occur under certain circumstances prior to dredging. This trawling will result in sea turtle and Gulf sturgeon takes, but these takes are not expected to be lethal due to the short duration of the tow times (15 to 30 minutes per tow). While relocating sea turtles and Gulf sturgeon may stress the animals, the level of stress should be minimized by proper, expedited handling. Additionally, capturing a live turtle or sturgeon in a relatively slowly advancing shrimp trawl net is less harmful to the animal than being entrained in a dredge draghead and pumped into a screening box. Thus, an unquantifiable number of live loggerhead, Kemp's ridley, green, and hawksbill sea turtles, and Gulf sturgeon, are anticipated to be taken during any relocation/assessment trawling deemed necessary by NMFS or the COE during hopper dredging of Sabine Pass and Freeport navigation channels.

In summary, NMFS believes that relocation trawling may effect, but is not likely to adversely effect listed species under NMFS purview and hereby modifies the 1995 RBO to include relocation/assessment trawling as a term and condition of the ITS.

Amendment No. 1:

The Amendment described below is modeled after terms and conditions found in the draft RBO currently under preparation. The 1995 RBO is amended (Amendment No. 1) as follows:

A. Conservation Recommendation No. 2 of the 1995 RBO is eliminated.

B. The following term and condition (No. 10) is added to the Incidental Take Statement of 1995 RBO, as follows:

10. Relocation Trawling and Relative Abundance Trawling: Relocation trawling and relative abundance trawling in association with hopper dredging projects in COE Galveston District's navigation channels, conducted by NMFS-approved endangered species observers, should be considered if: takes are documented early in the project during a period in which large numbers of sea turtles may occur; 2 or more turtles are taken in a 24-hour period; 4 or more turtles are taken in a project; seawater temperatures are unseasonably warm; large amounts of sea turtle prey species are being collected in the inflow screens; the take level for a particular species at a particular hopper dredging project is so high that the District is on verge of terminating the project and/or reaching its District species quota for that species; dredging is necessary outside the December 1-March 31 window or unseasonably warm temperatures exist during the window; evidence exists indicating that protected species presence may be high; a combination of these factors exists.

Lethal or injurious takes which result from relocation/assessment trawling (including capturing, handling, weighing, measuring, tagging, and releasing) in the Galveston District are limited to 1 (one) sea turtle and 1 (one) Gulf sturgeon per fiscal year and are subtracted from (counted against) the authorized, anticipated take levels discussed previously for hopper dredging; e.g., a Kemp's ridley injury or lethal take during a Galveston District's relocation/assessment trawling effort shall be counted as a documented take against the District's fiscal year anticipated take level or "quota." NMFS shall be immediately notified of any injuries sustained by protected species during relocation/assessment trawling.

The Galveston District shall each provide NMFS Southeast Regional Office with project completion reports detailing any relocation trawling and relative abundance trawling efforts and results at Sabine Pass and Freeport Channel.

This Opinion authorizes the unlimited non-lethal, non-injurious take of sea turtles and Gulf sturgeon in association with all relocation trawling and relative abundance trawling deemed necessary by the COE to temporarily reduce the abundance or assess the abundance of these species during and in the days preceding a hopper dredging project to reduce the possibility of lethal hopper dredge interactions, subject to the following conditions:

- A. Trawl tow-time durations shall be not longer than 30 minutes (doors in - doors out); 15-30 minutes is recommended.
- B. Turtles and sturgeon captured pursuant to relocation trawling or relative abundance trawling shall be handled in a manner designed to ensure their safety and comfort.
- C. Captured turtles shall be kept moist and whenever possible shaded until they are released.
- D. Turtles shall not be kept longer than 12 hours prior to release and shall be released as far away as practicable from the dredge site (if it can be done safely, turtles may be transferred onto another vessel for transport to the relocation site to enable the relocation trawler or relative abundance trawler to keep sweeping the dredge site); sturgeon shall be released as soon as possible after measuring, away from the dredge site or in already dredged areas.
- E. All turtles and sturgeon shall be measured prior to release (for turtles, standard carapace measurements including body depth; for sturgeon, fork length and total length), and weighed when it is possible to do so safely.
- F. Any endangered species injured or killed during or as a consequence of relocation trawling or relative abundance trawling shall count toward the appropriate COE District's incidental take quota.

G. All sea turtles captured by relocation trawling or relative abundance trawling shall be flipper-tagged prior to release with Inconel tags which must be previously obtained from the University of Florida's Archie Carr Center for Sea Turtle Research. This Opinion serves as the permitting authority for any NMFS-approved endangered species observer aboard a relocation trawler or relative abundance trawler to flipper-tag captured sea turtles with external tags (e.g., Inconel tags). Columbus crabs or other organisms living on external sea turtle surfaces may be sampled and removed under this authority.

H. All other tagging, external or internal sampling procedures (e.g., PIT tagging, blood letting, skin tag sampling, laparoscopies, gastric lavages, mounting satellite or radio transmitters, genetics sampling, etc.) for sea turtles or sturgeon are prohibited unless the observer holds a valid sea turtle or sturgeon research permit, pursuant to section 10 of the ESA, from the NMFS Office of Protected Resources, Permits Division, authorizing him or her to conduct the research, either as the permit holder, or as designated agent of the permit holder.

Conclusion:

NMFS PRD has determined that Amendment No. 1 to the 1995 RBO will not adversely affect listed species under NMFS purview. This concludes consultation responsibilities under section 7 of the ESA. Consultation should be reinitiated if there is a take, new information reveals impacts of the identified activity that may affect listed species or their critical habitat, a new species is listed, the identified activity is subsequently modified or critical habitat designated that may be affected by the identified activity.

If you have any questions about this consultation, please contact Eric Hawk at the letterhead phone number, or by e-mail at eric.hawk@noaa.gov.

Sincerely,

Joseph E. Powers, Ph.D.
Acting Regional Administrator

cc: F/PR1, F/PR3
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APPENDIX 2

TRAWLING SCOPE OF WORK

Trawling Scope of Work

INTRODUCTION

The following scope of work is for assessment of the relative abundance of sea turtles in entrance channels which are being maintained by hopper dredges. Sea turtles will be captured by trawling. The trawling survey will provide information on the times of occurrence and general location of turtles in these channels. Species, size, sex, and general condition will be recorded for captured turtles. The approach used for this survey standardizes the distance trawled (2 km, 1.08 nm) and flow direction (with the tidal flow).

OBJECTIVES

To determine relative abundance of sea turtles in the entrance channel 2 to 7 days prior to dredging.

TRAWLING SPECIFICATIONS:

Trawling will be conducted to capture turtles to determine relative abundance in the channel. Survey methods and equipment will be standardized as much as possible including data sheets, nets, trawling speed and direction to tide, length of segment, length of tow, and numbers of tows per segment. Trawling will be conducted with repetitive 15-30 minute (total time) tows in the channel. Data sheets will be provided by CE. Nets to be used will be the standard CE turtle nets used on previous surveys (Appendix A.). Trawling speed will be at a constant rate and consistent for each tow (approximately 2.5-3.0 knots). Trawling will be conducted with the tidal flow. A minimum of 6 tows per segment, 2 each in the green, red, and center portion of the channel. The channel will be divided into segments 3 km in length which will be set for all surveys in that channel. The segments will include the areas of the channel which will be dredged and a "buffer" segment in the channel on each side of the dredged segments. Each 3 km segment will be trawled for a distance of 2 km. Tow times will be adjusted from 15 to 30 minutes to achieve the 2 km tow length. Surveys will be conducted according to a randomized design consistent with NMFS survey protocol as much as possible.

Positions at the beginning and end of each tow will be determined from GPS positioning equipment. Tow speed will be taken at the approximate mid point of each tow.

NET SPECIFICATIONS:

The trawler will be fitted with two 60 foot trawling nets constructed from 8 inch mesh (stretch) as specified in the attached description. The nets will be fitted with mud rollers and floats as specified.

TURTLE HANDLING AND MEASUREMENTS

All turtles that are caught will be identified, measured, tagged and released back into the channel at the approximate point of capture. They will be released into the channels in the location where they are captured to determine their recapture rate. Turtles will be returned to the water as soon as possible after capture. Measurements will be taken according to the protocol detailed in Pritchard et al. 1983. At a minimum, straight line length, straight line width, tail length, and weight will be taken. Turtles will be tagged with NMFS #881 Inconel tags in each of the front flippers according to National Marine Fisheries protocol. Trovan Passive Integrated Transponder (PIT) tags will be injected subcutaneously in the wrist area of the turtles right front flipper. Aseptic conditions will be maintained for tag attachment and tags. Data on turtles will be entered in a standard data sheet in a format provided by the Corps of Engineers (Appendix B.). Photographs will be taken of each turtle captured. Included in the photograph will be a 4 x 6 card with the tag numbers, date, and location written in large black letters. Additional photographs will be taken of methods, injured turtles, unusual bycatch, or other items of technical interest. A copy of the photos will be provided to the Corps of Engineers.

WATER QUALITY AND PHYSICAL MEASUREMENTS

Water temperature measurements will be taken at surface, mid depth, and bottom each slack tide during the sample period for a minimum of one measurement at the beginning and one at the end of the sample period (each month). Weather conditions will be recorded including air temperature, wind velocity and direction, sea

state-wave height, and precipitation. This information can be obtained from the local weather service. High and low tides that include each tow time will be recorded in military time.

SAMPLE PERIODS

Trawl surveys will be conducted in the channel two to seven days prior to initiation of dredging.

PERMITS

Permits for handling threatened and endangered species and for collecting other organisms will be obtained from the appropriate agencies.

APPENDIX B: TURTLE TRAWL NETS SPECIFICATIONS

Back

DESIGN: 4 seam, 4 legged, 2 bridal trawl net

WEBBING: 4 inch bar, 8 inch stretch top - 36 gauge twisted nylon dipped side - 36 gauge twisted nylon dipped bottom - 84 gauge braided nylon dipped

NET LENGTH: 60 ft from cork line to cod end

BODY TAPER: 2 to 1

WING END HEIGHT: 6 ft

CENTER HEIGHT: Dependent on depth of trawl 14 to 18 ft

COD END: Length 50 meshes x 4" = 16.7 ft Webbing 2 inch bar, 4 inch stretch, 84 gauge braid nylon dipped, 80 meshes around, 40 rigged meshes with 1/4 x 2 inch choker rings, 1 each « x 4 inch at end cod end cover - none chaffing gear - none

HEAD ROPE: 60 ft « inch combination rope (braid nylon with stainless cable center)

FOOT ROPE: 65 ft « inch combination rope

LEG LINE: top - 6 ft, bottom 6 - ft

FLOATS: size - tuna floats (football style), diameter - 7 inch length - 9 inch, number - 12 each, spacing - center on top net 2 inches apart

MUD ROLLERS: size 5 inch diameter 5.5 inch length, number - 22 each, spacing - 3 ft attached with 3/8 inch polypropylene rope (replaced with snap on rollers when broken)

TICKLER CHAINS: NONE (discontinued- but previously used 1/4 inch x 74 ft galvanized chain)

WEIGHT: 20 ft of 1/4 inch galvanized chain on each wing, 40 ft per net looped and tied

DOOR SIZE: 7 ft x 40 inches (or 8 ft x 40 inches), Shoe - 1 inch x 6 inch, bridles - 3/8 inch high test chain

APPENDIX 3
SEA TURTLE TAGGING REPORTS

Channel: Sabine Pass Date: 7/22/02
 Tow #: 009 Net (circle) Post Starboard
 Species: Caretta caretta Sex (circle) Male Female Unknown

Capture Information:

Capture Location: State: Texas County: Jefferson
 Lat: 29° 29. 715 Long: 93° 39. 942
 Capture Method:

Flipper Tag Information:

Left: ABA 703
 Right: ABA 704
 PIT Tag #:

Species Information:

Straight Carapace Length: (n-n) 62.5 (t-t) 65.5 Straight Carapace Width: 53.5
 Curved Carapace Length: (n-n) 68 (t-t) 70 Curved Carapace Width: 64.5
 Plastron Length: 50 Plastron Width: 40
 Tail Length: 13 Head Width: 16.5
 Condition of Specimen: One small laceration on right flipper.

Miscellaneous:

Blood taken: YES NO # of vial
 Photos taken: YES NO
 Recapture: - this effort - previous effort
 Organization Tagging: ASMMA, Inc.
 Personnel: Will Parks

Turtle Release Information:

Date: 7/22/02 Time: 1932
 Lat: 29° 29. 534 Long: 93° 38. 410
 State: Texas County: Jefferson

Remarks: (note injuries, gear or debris entanglement, wounds or mutations, propeller damage, papillomas, tag locations, etc.)

- Small laceration on right flipper
- Left rear flipper missing - completely broken
- Turtle seems very healthy

Channel: Sabine Pass Date: 7/24/02
 Tow #: 036 Net (circle) Port Starboard
 Species: Caretta caretta Sex (circle) Male Female Unknown

Capture Information:

Capture Location: State: Texas County: Jefferson
 Lat: 29° 29.280 Long: 93° 40.236
 Capture Method: Other Trawl

Flipper Tag Information:

Left: ABA 705
 Right: ABA 706
 PIT Tag #: —

Species Information:

Straight Carapace Length: (n-n) 66cm (t-t) 70cm Straight Carapace Width: 56cm
 Curved Carapace Length: (n-n) 72cm (t-t) 76cm Curved Carapace Width: 64.9cm
 Plastron Length: 54cm Plastron Width: 51cm
 Tail Length: 18.5cm Head Width: 15cm
 Condition of Specimen: Healthy

Miscellaneous:

Blood taken: YES (NO) # of vials
 Photos taken: YES (NO)
 Recapture: — this effort — previous effort
 Organization Tagging: BEHSA, Inc.
 Personnel: Will Parks

Turtle Release Information:

Date: 7/24/02 Time: 2000
 Lat: 29° 29.106 Long: 93° 37.842
 State: Texas County: Jefferson

Remarks: (note injuries, gear or debris entanglement, wounds or mutations, propeller damage, papillomas, tag locations, etc.)

Turtle Tagging Data Report

Channel: SABINE PASS Date: 7/28/02
 Tow #: 094 Net (circle) Port Starboard
 Species: Lepidochelys kempi Sex (circle) Male Female Unknown

Capture Information:

Capture Location: State: TEXAS County: JEFFERSON
 Lat: 29° 37.739 N Long: 93° 48.837 W
 Capture Method: OTTER TRAWL

Flipper Tag Information:

Left: RRA 707
 Right: RRA 708
 PIT Tag #: —

Species Information:

Straight Carapace Length: (n-n) 24.1 (t-t) 35.3 Straight Carapace Width: 32.2
 Curved Carapace Length: (n-n) 35.2 (t-t) 36.4 Curved Carapace Width: 37.1
 Plastron Length: 27.2 Plastron Width: 26.5
 Tail Length: 4.1 Head Width: 8.1
 Condition of Specimen: HEALTHY, SEE REMARKS

Miscellaneous:

Blood taken: YES NO # of vile
 Photos taken: YES NO
 Recapture: — this effort — previous effort
 Organization Tagging: REMSA, INC.
 Personnel: WILL PARKS, GARY SUNDIN

Turtle Release Information:

Date: 7/28/02 Time: 1955
 Lat: 29 37.329 N Long: 93 45.887 W
 State: TEXAS County: JEFFERSON

Remarks: (note injuries, gear or debris entanglement, wounds or mutations, propeller damage, papillomas, tag locations, etc.)

LEFT REAR FLIPPER MISSING EXCEPT STUMP - WELL HEALED, OLD INJURY
RIGHT REAR FLIPPER MISSING TIP - WELL HEALED, OLD INJURY

Turtle Tagging Data Report

Channel: Sabine Pass Date: 7/30/02
 Tow #: 138 Net (circle) Port Starboard
 Species: Lepidochelys kempi Sex (circle) Male Female Unknown

Capture Information:

Capture Location: State: Texas County: Jefferson
 Lat: 29° 37.620 Long: 93° 47.067
 Capture Method: Otter Trawl

Flipper Tag Information:

Left: RRA 709
 Right: RRA 710
 PIT Tag #: —

Species Information:

Straight Carapace Length: (n-n) 32.8 cm (t-t) 33.5 cm Straight Carapace Width: 31.3 cm
 Curved Carapace Length: (n-n) 34.4 cm (t-t) 35 cm Curved Carapace Width: 36.2 cm
 Plastron Length: 26.5 cm Plastron Width: 26.3 cm
 Tail Length: 3.5 cm Head Width: 8.5 cm
 Condition of Specimen: Healthy

Miscellaneous:

Blood taken: YES NO # of vial
 Photos taken: YES NO
 Recapture: — this effort — previous effort
 Organization Tagging: BGMSA, Inc.
 Personnel: Will Parks, Gary Sundin

Turtle Release Information:

Date: 7/30/02 Time: 2105
 Lat: 29° 36.285 Long: 93° 46.373
 State: Texas County: Jefferson

Remarks: (note injuries, gear or debris entanglement, wounds or mutations, propeller damage, papillomas, tag locations, etc.)

Turtle is healthy with no injuries or ^{Prior} wounds.
- PROBABLE OLD TAG SCAR LEFT FRONT FLIPPER.
- PIT SCAN NEGATIVE.

Scientific Collection Data Report

Channel: Sabine Pass Date: 07 Aug 02
 Tow #: 341 Net (circle) Port Starboard
 Species: Caretta caretta Sex (circle) Male Female Unknown

Capture Information:

Capture Location: State: Texas County: Jefferson
 Lat: 29°33.059 Long: 93°45.284
 Capture Method: relocation trawling - otter trawl

Flipper Tag Information:

Left: ARR 711
 Right: ARR 712
 PIT Tag #:

Species Information:

Straight Carapace Length: (n-n) 71.5 (t-t) 74 Straight Carapace Width: 58.6
 Curved Carapace Length: (n-n) 77 (t-t) 78.5 Curved Carapace Width: 72 cm
 Plastron Length: 55.5 Plastron Width: 54
 Tail Length: 18.5 Head Width: 15.5
 Condition of Specimen: Very healthy ~ minimal epibiota

Miscellaneous:

Blood taken: YES NO # of vial
 Photos taken: YES NO
 Recapture: this effort previous effort
 Organization Tagging: Remsa, Inc.
 Personnel: Trish Bargo / Tamberly Kerr

Turtle Release Information:

Date: 07 Aug 02 Time: 1200 hrs
 Lat: 29°30.075 Long: 93°45.511
 State: Texas County:

Remarks: (note injuries, gear or debris entanglement, wounds or mutations, propeller damage, papillomas, tag locations, etc.)

NONE ~ HEALTHY

~ NO PRIOR PIT OR FLIPPER TAGS ~

Field Report

Date: 08 AUG 02
 Net (circle) Port Starboard
 Sex (circle) Male Female Unknown

County: _____
 Long: 93° 40.118

Straight Carapace Length: (h-w) 62.7 (h-w) 65 Straight Carapace Width: 61.8
 Curved Carapace Length: (h-w) 67 (h-w) 69.3 Curved Carapace Width: 69
 Plastron Length: 47.5 Plastron Width: 51.7
 Tail Length: 31 Head Width: 13.7
 Condition of Specimen: Beautiful ~ healthy

Miscellaneous:
 Blood taken: NO # of vials _____
 Photos taken: YES NO _____
 Recapture: _____ this effort _____ previous effort
 Organization Tagging: Remsa, Inc.
 Personnel: Trish Bargo

Turtle Release Information:
 Date: 08 Aug 02 Time: 1410
 Lat: 29° 27.759 Long: 93° 42.620
 State: Texas County: Jefferson

Remarks: (note injuries, gear or debris entanglement, wounds or mutations, propeller damage, papillomas, tag locations, etc.)
No Barnacles

Channel: Sabine Pass Date: 10 Aug 2002 - 01
Tow #: 435 Net (circle) Port Starboard
Species: caretta caretta Sex (circle) Male Female Unknown

Capture Information:

Capture Location: State: Texas County: Jefferson
Lat: 29° 26.712 Long: 93° 40.198
Capture Method: _____

Flipper Tag Information:

Left: RAA 715
Right: RAA 716
PFT Tag #: _____

Species Information:

Straight Carapace Length: (n-n) 69.6 (t-t) 71.5 Straight Carapace Width: 56.9
Curved Carapace Length: (n-n) 75 (t-t) 76.5 Curved Carapace Width: 70.5
Plastron Length: 56 Plastron Width: 51.5
Tail Length: 14 Head Width: 14 cm
Condition of Specimen: Healthy

Miscellaneous:

Blood taken: YES NO # of vial _____
Photos taken: YES NO _____
Recapture: _____ this effort _____ previous effort
Organization Tagging: Remsa, Inc.
Personnel: Trish Bargo

Turtle Release Information:

Date: 10 AUG 02 Time: 2040
Lat: 29° 28.128 Long: 93° 42.732
State: Texas County: Jefferson

Remarks: (note injuries, gear or debris entanglement, wounds or mutations, propeller damage, papillomas, tag locations, etc.)

Channel: Sabine Pass Date: 10 AUGUST 2002 - 02
Tow #: 435 Net (circle) Port Starboard
Species: Caretta caretta Sex (circle) Male Female Unknown

Capture Information:

Capture Location: State: Texas County: Jefferson
Lat: 29°26.712 Long: 93°40.198
Capture Method: _____

Flipper Tag Information:

Left: RAA 717
Right: RAA 718
PIT Tag #: _____

Species Information:

Straight Carapace Length: (n-n) 85.2 (t-t) 87.4 Straight Carapace Width: 63.8
Curved Carapace Length: (n-n) 90.5 (t-t) 93 Curved Carapace Width: 86.8
Plastron Length: 65 Plastron Width: 59
Tail Length: 17 cm Head Width: 20 cm
Condition of Specimen: Healthy

Miscellaneous:

Blood taken: YES NO # of vile _____
Photos taken: YES NO _____
Recapture: this effort previous effort _____
Organization Tagging: Remsa, Inc.
Personnel: Trish Bargo

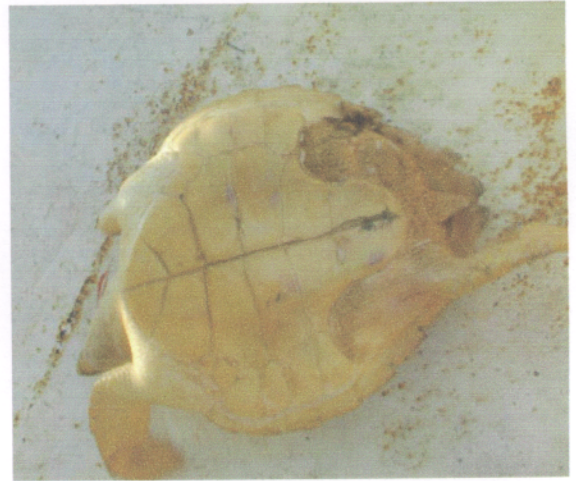
Turtle Release Information:

Date: 10 Aug 02 Time: 2040
Lat: 29°29.128 Long: 93°42.732
State: Texas County: Jefferson

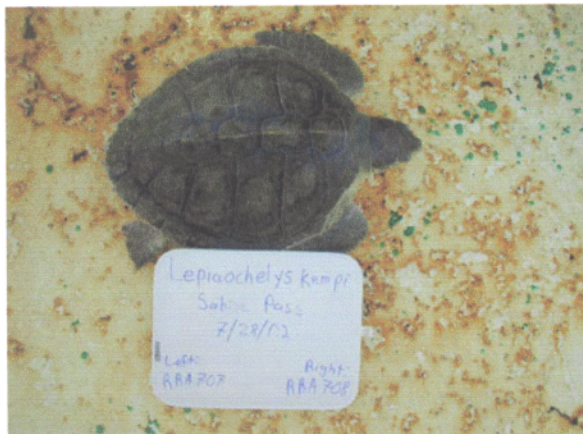
Remarks: (note injuries, gear or debris entanglement, wounds or mutations, propeller damage, papillomas, tag locations, etc.)



Loggerhead
22 July 02
Tow #009

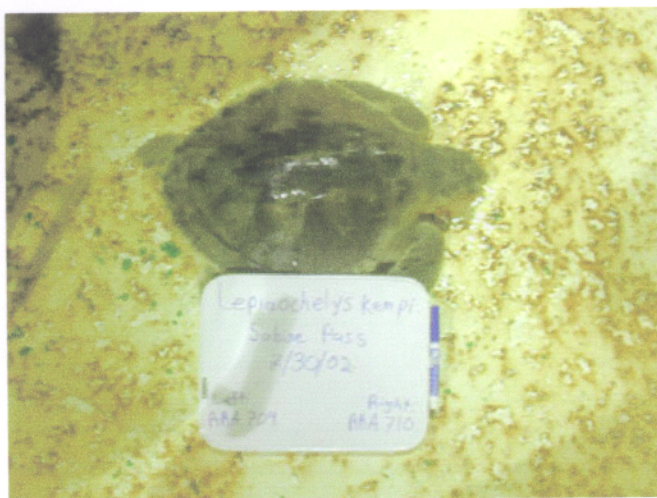


Loggerhead
24 July 02
Tow #036



Kemp's Ridley
28 July 02
Tow #094





Kemp's Ridley
30 July 02
Tow #138



Loggerhead
07 August 02
Tow #341



Kemp's Ridley
08 August 02
Tow #380



Loggerhead
10 August 02
Tow # 435
Turtle #1



Loggerhead
10 August 02
Tow #435
Turtle #2

APPENDIX 4
TEXAS STATE PERMIT

SCIENTIFIC PERMIT NUMBER SPR-0602-228
IS HEREBY ISSUED TO:

PATRICIA BARGO
(REMISA INC.)

UNDER THE AUTHORITY OF CHAPTER 43, SUBCHAPTER C OF THE
TEXAS PARKS AND WILDLIFE CODE

The activities permitted by this document are to be carried out in accordance with the Texas Parks and Wildlife Code, the Rules and Regulations of the Texas Parks and Wildlife Commission, and all of the following provisions:

1. This permit may not be transferred, assigned or conveyed by the holder.
2. The issuance of this permit is not a guarantee that a subsequent permit or renewal of this permit will be granted.
3. Required information and data shall be maintained at the address of the permit holder and shall be available for inspection at the request of personnel of the Texas Parks and Wildlife Department during the active life of the permit.
4. Acceptance of this permit constitutes an acknowledgment and agreement that the holder will comply with all Rules, Regulations, Orders and Proclamations of the Texas Parks and Wildlife Commission issued in accordance with the law and the conditions precedent to the granting of this permit. Failure to comply with any and all provisions of this permit may result in enforcement action, including criminal penalties authorized by the Parks and Wildlife Code, and the revocation of this permit.
5. This permit does not relieve the holder of the responsibility to obey all other local, county, state and federal laws while carrying out the authorized activities.

- ADDITIONAL PROVISIONS FOLLOW ON ATTACHED PAGES. -

Robert L. Cook
EXECUTIVE DIRECTOR
TEXAS PARKS AND WILDLIFE DEPARTMENT
Issued by:



July 19, 2002
Effective date
Amended

John Herron
Chief, Wildlife Diversity Branch

6. This permit will expire at midnight, July 3, 2005.
7. The following individuals may conduct activities authorized by this permit under the guidance of the permittee:

William R. Parks, Jr.

SCIENTIFIC PERMIT NO. SPR-0602-228

8. The following wildlife species in the specified quantities are authorized by this permit to be:

a. taken from the public waters of Texas by trawl for scientific purposes, permanently marked by tattoo, tag, band or PIT tag and relocated to appropriate habitat to prevent recapture or injury during dredging activities.

Common Name	Scientific Name	Quantity
Loggerhead sea turtle	<i>Caretta caretta</i>	NTE 200
Kemp's ridley sea turtle	<i>Lepidochelys kempii</i>	NTE 100
Green sea turtle	<i>Chelonia mydas</i>	NTE 100
Atlantic Hawkbill sea turtle	<i>Eretmochelys imbricata</i>	NTE 20
Leatherback sea turtle	<i>Dermochelys coriacea</i>	NTE 20

b. All marine fish and invertebrates taken incidentally during the capture of the above listed species are to be released at the waters of origin.

9. The following means for capture are authorized by this permit:

a. as specified above.

10. The following locations for taking or capture are authorized by this permit:

- a. Free Port Channel, Texas
- b. Sabine Pass, Texas

11. All specimens captured shall be released in appropriate areas so as not to be recaptured or injured during dredging activities. All specimens injured or killed during capture activity shall be handled as described in section 12d.

12. PERMIT HOLDER IS REQUIRED TO:

a. File a completed report form annually (provided on issuance of this permit), and any reports or publications based on data collected under authority of this permit, with the Texas Parks and Wildlife Department, Wildlife Permits Section, 4200 Smith School Rd., Austin, TX, 78744, no later than fourteen days following the anniversary date of the permit (or the expiration date if the permit is due for renewal).
YOUR PERMIT WILL NOT BE VALID UNLESS YOUR REPORT HAS BEEN RECEIVED.

b. Carry a copy of this permit at all times when exercising the provisions of this permit, which shall be subject to inspection by any authorized enforcement officer of the Department upon request.

c. Notify the Parks and Wildlife Department Law Enforcement Office(s) in the region(s) of your field activities by telephone not less than 24 hours in advance if collection techniques or devices being used are ordinarily classified as illegal methods of taking game (i.e., shooting game animals at night by use of light; taking game species during closed

SCIENTIFIC PERMIT NO. SPR-0601-228

seasons; using gill nets or electro-shocking devices to collect fish, etc.). If the regional office(s) or telephone number(s) is unknown, the number(s) may be obtained at any time by calling a Parks and Wildlife Communication Center: Austin - (512) 389-4648; Houston - (281) 842-8100.

d. Dispose of protected wildlife taken under authority of this permit in one of the following ways:

1. Transfer any protected wildlife injured during activity under the authority of this permit to a primary care facility or an appropriate rehabilitation facility.
2. All incidental fatalities should be handled and disposed of according to NMFS guidelines.
3. Release to appropriate habitat.

13. PERMIT HOLDER IS PROHIBITED FROM:

- a. Selling or bartering specimens collected under the authority of this permit. Specimens may be donated to other permit holders by completing the receipt form enclosed with the permit.
- b. Collecting on private premises without prior written consent of the owner or operator of the premises.
- c. Collecting in a state park without prior written permission from Texas Parks and Wildlife Department Natural Resource Program: (512) 389-4679, fax: (512) 389-4495, email: david.rickard@tpwd.texas.gov.
- d. Collecting in a wildlife management area without prior written permission from the area manager.
- e. Taking species listed in the Department's Threatened or Endangered species rules without express authority in paragraph 8 of this permit.

14. ADDITIONAL PROVISIONS:

- a. No hunting or fishing license is required for permit holders or individuals listed in paragraph 7 while conducting the activities expressly authorized by this permit. Each listed individual should carry a copy of this permit during collection activities, and a letter of permission from the permittee if working independently.
- b. This permit is subject to any applicable federal permit requirements. Where a federal permit is required, the permit holder is cautioned to carry a copy of the federal as well as the state permit during collecting activity.

15. PERMIT HOLDER'S ADDRESS FOR RECORDKEEPING PURPOSES:

Patricia Bargo
1427 W. Ocean View Avenue
Norfolk, VA 23503

APPENDIX 5 BYCATCH

BYCATCH

The following is a list of species encountered during the trawling project at Sabine, Texas. The numbers have been estimated. Approximately forty (40%) percent of the 489 tows of thirty (30) minutes or less resulted in no bycatch.

Loggerhead Sea Turtle- *Caretta caretta*-(5)
Kemp's Ridley-*Lepidochelys kempii*-(3)
Cownose Ray-*Rhinoptera bonasus*-(1,000)
Smooth Butterfly Ray-*Gymnura micrura*- (5)
Southern Stingray-*Dasyatis Americana*-(12)
Sandbar Shark-*Carcharhinus plumbeus*-(30)
Bull Shark-*Carcharhinus leucas*-(15)
Blacktip Shark-*Carcharhinus limbatus*-(5)
Dusky Shark-*Carcharhinus obscurus*-(2)
Bonnethead-*Sphyrna tiburo*-(10)
Scalloped Hammerhead-*Sphyrna lewini*-(15)
Atlantic Cutlassfish-*Trichiurus lepturus*-(450)
Atlantic Spadefish-*Chaetodipterus faber*-(15)
Sheepshead-*Archosargus probatocephalus*-(20)
Weakfish-*Cynoscion regalis*-(60)
Silver Seatrout-*Cynoscion nothus*-(5)
Red Drum-*Sciaenop ocellatus*-(20)
Black Drum-*Pogonias cromis*-(65)
Atlantic Croaker-*Micropogonias undulates*-(60)
Atlantic Tripletail-*Lobotes surinamensis*-(2)
Gafftopsail Catfish-*Bagre marinus*-(250)
Hardhead Catfish-*Ariopsis felis*-(20)
Pinfish-*Lagodon rhomboids*-(150)
Gulf Menhaden-*Brevoortia patronus*-(100)
Harvestfish-*Pepnilus paru*-(25)
Lookdown-*Selene vomer*-(50)
Atlantic Moonfish-*Selene setapinnis*-(65)
Blue Crab-*Callinectes sapidus*-(400)